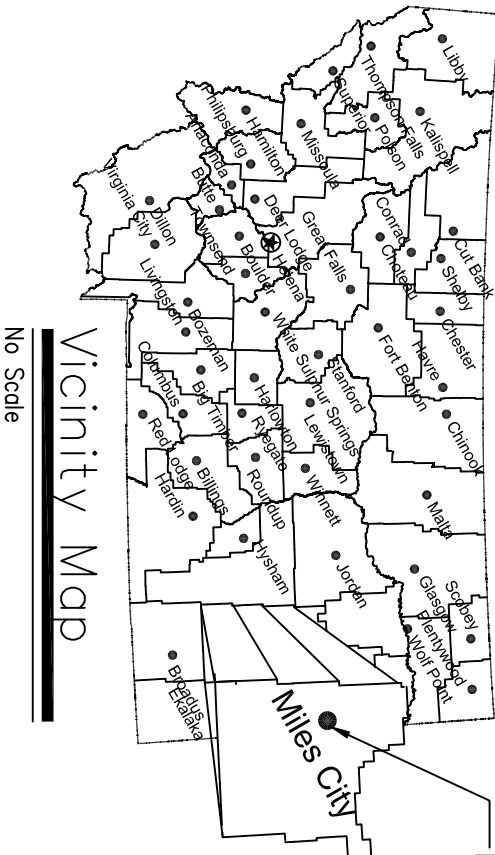




Montana Fish,  
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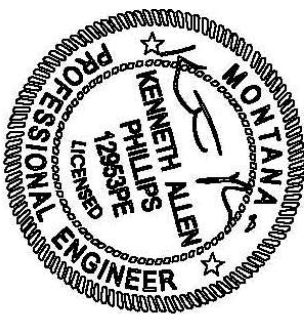
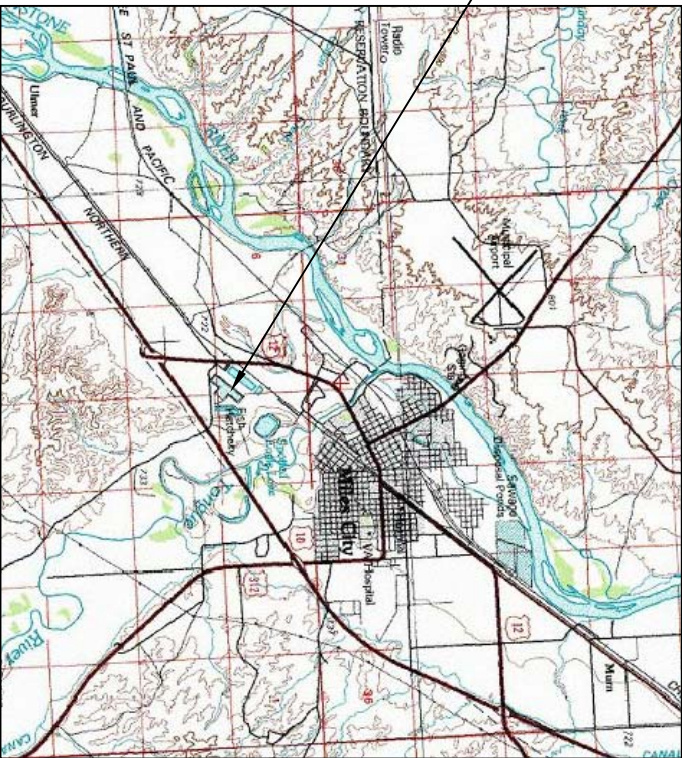
# Miles City Hatchery Liner Repairs

Prepared By Design & Construction Bureau  
P.O. Box 200701 Helena, MT 59620-0701



Vicinity Map  
No Scale

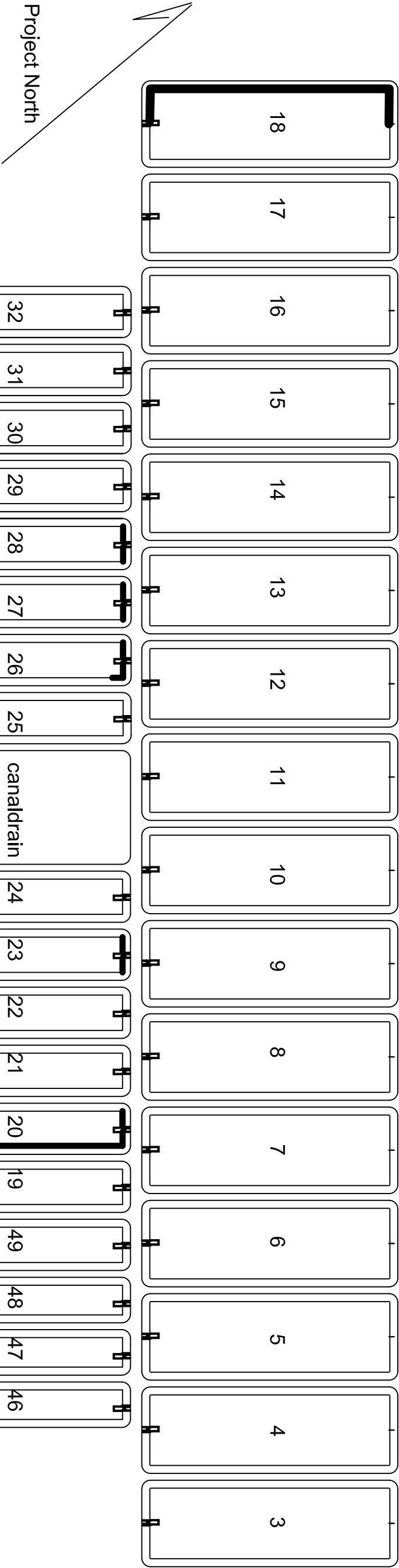
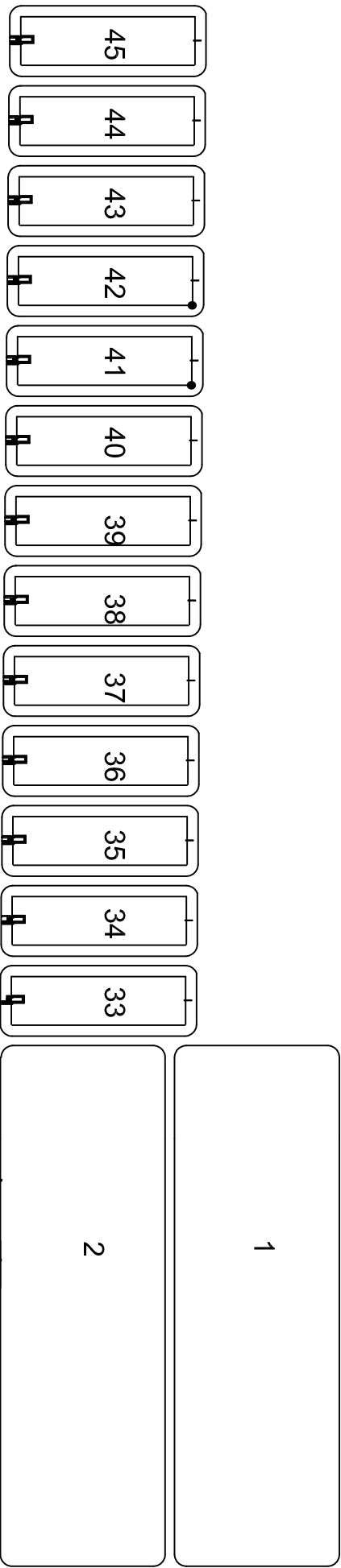
Project  
Location



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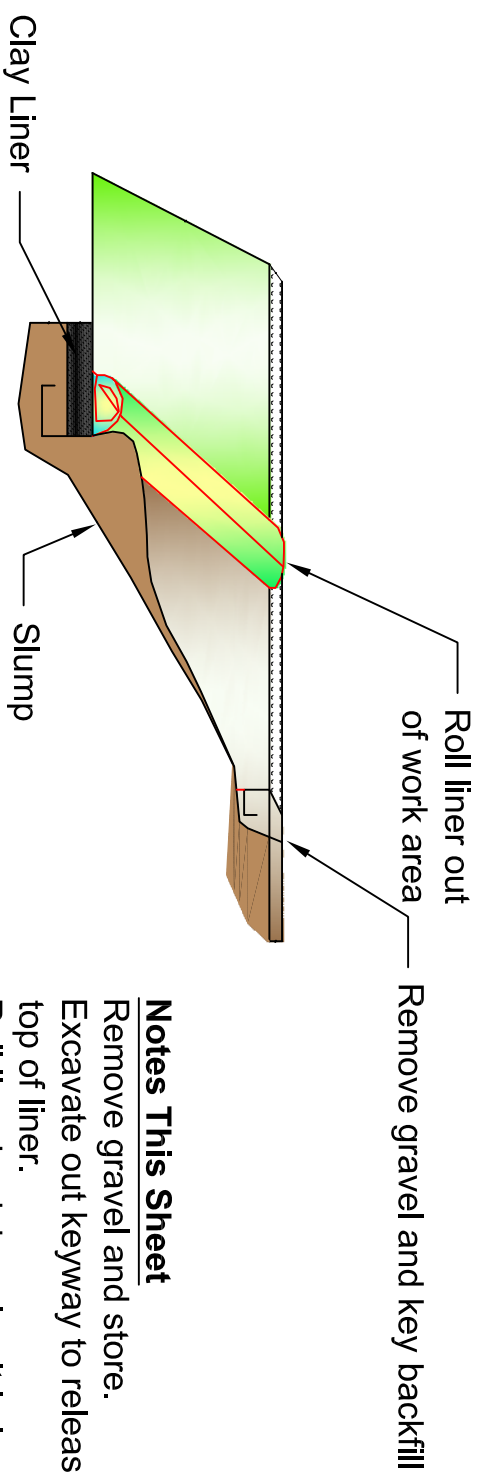
Sheet 1	Cover
Sheet 2	Site Plan
Sheet 3	Slump Repairs
Sheet 4	Pond 18 Liner Replacement
Sheet 5	Pond 20 Liner Replacement

K Phillips		6/2012	
DRAWN BY:	DATE:	REVISED BY:	DATE:
CHECKED BY:	DATE:	APPROVED BY:	DATE:
			
Miles City Hatchery		Miles City Hatchery	
Hatchery Liner Repairs		Hatchery Liner Repairs	
7113103		SHEET: 1 of 5	



Pond		Repair	
18	Replace liner on west half of pond	20	Repair end slump and replace liner on east half of pond
23	Repair end slump and portion of Liner	26	Repair end slump and portion of liner
27	Repair end slump	28	Repair end slump

POND LINER REPAIRS OR REPLACEMENT



## Remove gravel and key backfill

Clay Liner — Slump

# Slump

## Section A-A

## Notes This Sheet

Remove gravel and store.

Excavate out keyway to release top of liner.

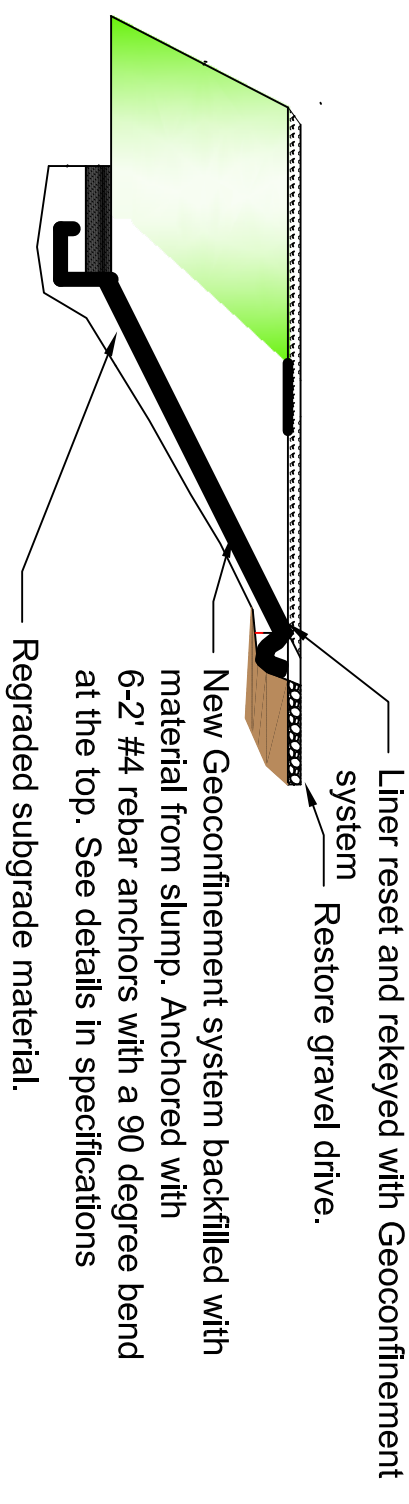
Roll liner back keeping it in lower keyway.

Remove soil from slumped area.

Finish grade subgrade.

**Install geoinfrastructure system and Backfill cells with existing material.**

Reset and rekey liner.

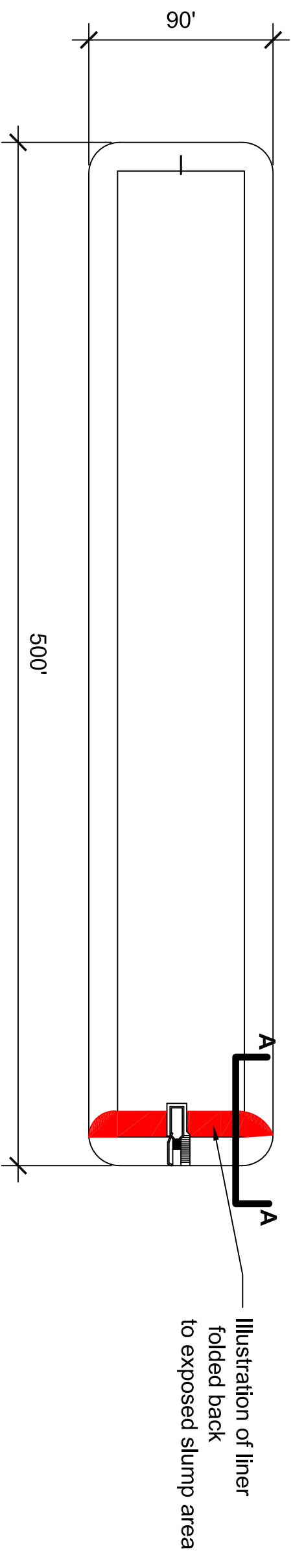


Restore gravel drive.

New Geoconfinement system backfilled with material from slump. Anchored with 6-2' #4 rebar anchors with a 90 degree bend at the top. See details in specifications

Regraded subgrade material.

## **Section A-A after repairs**



## Example of slump

**Typical small pond showing slump repairs**

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K Phillips 6/2012

DRAWN BY: DATE:

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REVISED BY:      DATE:

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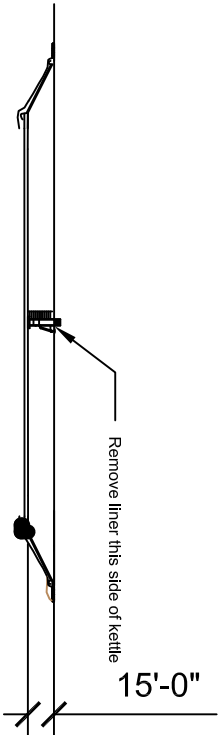
# Montana Fish, Wildlife & Parks

# Miles City Hatchery Hatchery Liner Repair

## Slump repair details

7113103

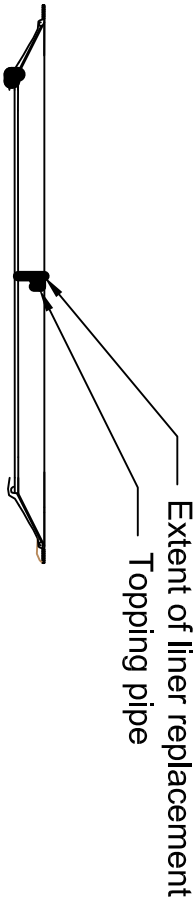
SHEET:  
5 of 3



### Section A-A

#### Notes Section A-A

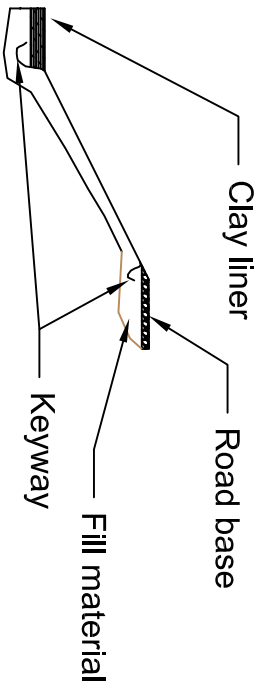
1. Remove liner from kettle by removing from termination strip.
2. Replace new liner to kettle with new termination strip. If holes are reused expoxy anchors into the existing holes to prevent pull out.



### Section B-B

#### Notes on Section B-B

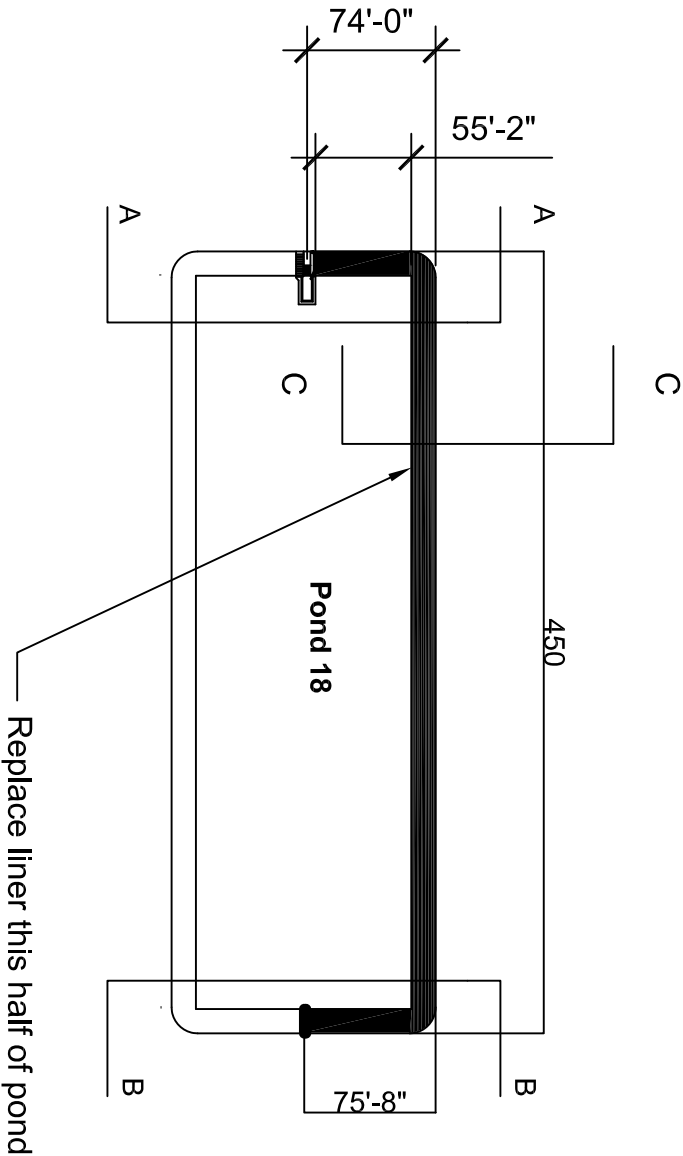
Cut liner approximately 1 foot from the topping pipe penetration. Cut line in a neat straight line running verticle down the slope, perpendicular to the bottom of the pond. Allow enough material to properly weld the new liner to the existing.



### Section C-C

#### Notes on Section C-C

1. Key in top and bottom of liner in a smooth radii, 2' deep and 2' wide.

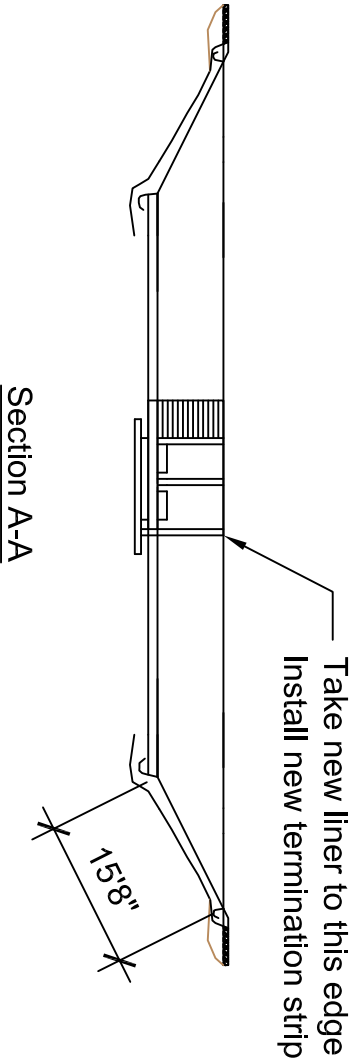


#### Notes for Pond 18

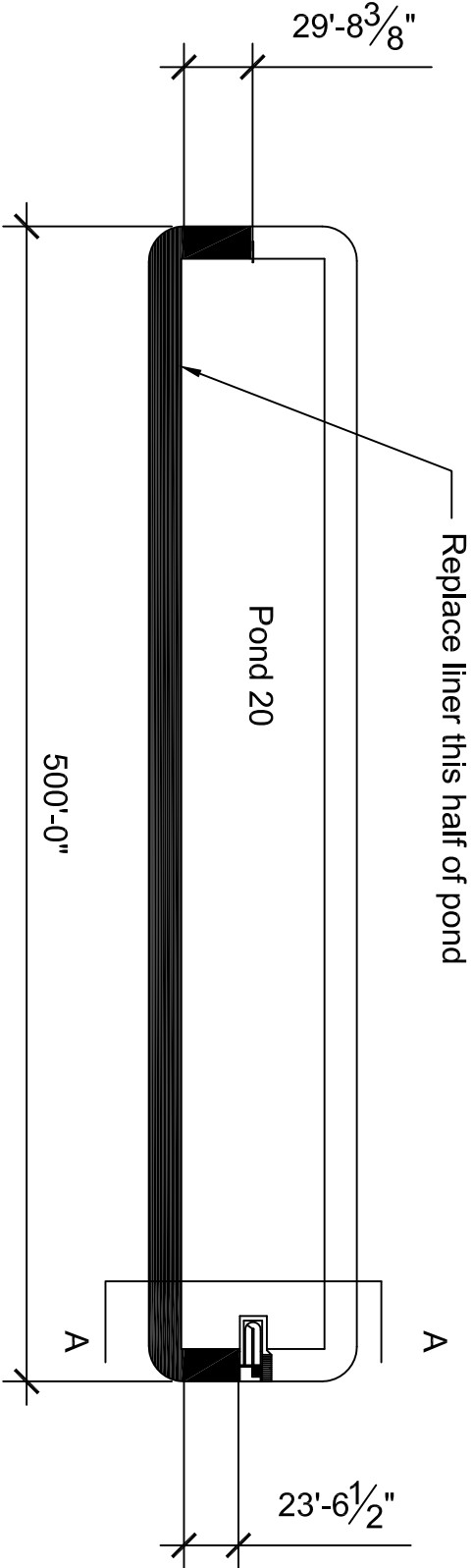
- A. Pond 18 will have half of its existing liner removed starting at the easterly side of the kettle continuing along the entire northeast side along the eastern side and almost to the fill pipe on the south east side.
- B. Contractor to salvage all the gravel material from the road way above the keyway to allow removal of the old liner from the keyway. Salvage fill material to rebed the liner.
- C. Remove clay soil layer at the bottom of the pond along edge of wall to access the keyway for the bottom of the liner. Store this material so that it does not get contaminated with other material for reuse. The material can be placed in a windrow adjacent to the trench at the bottom of the pond.
- D. After placing liner compacted upper fill material in trench at 95% of standard proctor.
- E. Backfill lower trench first with fill material and then finish the last 1' with the clay material. Ensure that the clay material has a homogenous section and then compact clay using a sled type compactor at optimal moisture content.
- F. Replace, regrade and compact road mix back to the original section at the top of the pond.



Pond 20 photo



Section A-A



Pond 20 Plan View

Notes for Pond 20

1. Pond 20 gets the liner replaced on the sides and ends that are dimensioned. Starting one foot from the topping pipe to the west side of the kettle. Please refer to sequence of work as found on Sheet 3/5